

REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-17 are presently active in this case; Claims 1-3, 5-7, and 9-13 having been amended by way of the present amendment.

In the outstanding Office Action, the drawings were objected to for minor informalities; Claims 1-3 were objected to for minor informalities; Claims 1-3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,949,009 to Iwamoto; Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Iwamoto in view of U.S. Patent No. 4,827,178 to Higashinakagawa et al.

First, Applicants note that in response to the restriction requirement of January 17, 2003, Applicants elected Group I (claims 1-8). However, the Official Action addresses only Claims 1-4 without indicating that Claims 5-8 are allowable. Applicants respectfully request that the examiner clarify the status of Claims 5-8. In this regard, Applicants note that Claims 5-8 have been amended consistent with the changes made to Claims 1-4. Therefore, Claims 5-8 are believed to be in condition for allowance for the reasons noted below with respect to Claims 1-4 .

In response to the objection to the drawings, the specification has been amended to use reference designations consistent with the drawings. In addition, submitted herewith is a separate Letter Submitting Replacement Drawing Sheets for Figures 3 and 8. The

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In response to the objection to the drawings, the specification has been amended to use reference designations consistent with the drawings. In addition, submitted herewith is a separate Letter Submitting Replacement Drawing Sheets for Figures 3 and 8. The replacement sheets change reference designation "40" to --41-- in Figure 3 and reference designation "40" to --43-- in Figure 8. The replacement sheets also add convex portions 24' to Figure 3. These sheets replace the original sheets. Therefore, the objection to the drawings is believed to be overcome.

With regard to the objections to claims 1, 2 and 3, these claims have been amended to change the expression "and/or" to "at least one of: (I) a plurality of concave portions and (II) a

plurality of convex portions." The claims now make clear that the scope of the present invention includes only a plurality of concave portions, or only a plurality of convex portions, or both a plurality of concave portions and a plurality of convex portions. With regard to the objection to the use of the term "electrode," Applicants respectfully traverse this objection. Specifically, Claims 1 and 5 clearly recite that a contact surface of an electrode contacts the *"inner surface of the skirt portion."* It is Applicants' position that one of ordinary skill in the art would understand that the electrode defined in the claims corresponds to the pressing electrode. Moreover, the structural relationship between the electrode and the skirt portion is clearly defined in the claims and, therefore, Applicants further submit that it is not necessary to add the limitation "pressing electrode" to the claims. By way of the foregoing amendments and explanation, Applicants submit that the objection to the claims is overcome.

Turning now to the merits, Applicants' Claim 1 is directed to a shadow mask used in a cathode ray tube. The shadow mask includes a mask body having a mask effective section where a number of electron beam passage apertures are formed and a skirt portion provided at a peripheral edge of the mask effective section, and a mask frame arranged outside the skirt portion and resistance-welded to the skirt portion at a plurality of portions. Also recited is that the skirt portion includes an outer surface in contact with the mask frame, an inner surface positioned opposite to the outer surface, and at least one of: (I) a plurality of concave portions and (II) a plurality of convex portions formed on that region of the inner surface of the skirt portion which a contact surface of an electrode for resistance-welding contacts, in each of the welding portions, the at least one of: (I) the plurality of concave portions and (II)

the plurality of convex portions each having a smaller area than an area of the contact surface of the electrode, the contact surface of the electrode having a diameter smaller than a width of the skirt portion.

Similarly, Claim 5 recites a cathode ray tube including a panel provided with a phosphor screen on an inner surface of the panel, a shadow mask arranged facing the phosphor screen, and an electron gun for emitting an electron beam onto the phosphor screen through the shadow mask. Also recited is that the shadow mask includes a mask body having a mask effective section where a number of electron beam passage apertures are formed and a skirt portion provided at a peripheral edge of the mask effective section, and a mask frame arranged outside the skirt portion and resistance-welded to the skirt portion at a plurality of portions, and the skirt portion includes an outer surface in contact with the mask frame, an inner surface positioned opposite to the outer surface, and at least one of: (I) a plurality of concave portions and (II) a plurality of convex portions formed on that region of the inner surface of the skirt portion which a contact surface of an electrode for resistance-welding contacts, in each of the welding portions, the at least one of: (I) the plurality of concave portions and (II) the plurality of convex portions each having a smaller area than an area of the contact surface of the electrode, the contact surface of the electrode having a diameter smaller than a width of the skirt portion.

Thus, Claims 1 and 5 have been amended to recite that "the contact surface of the electrode has a diameter smaller than a width of the skirt portion". This structure is evident

from FIGS. 4, 6, 7, 9, 11 and 12 of the specification as originally filed and, therefore, the amendments are not believed to raise a question of new matter.

As described in Applicants' specification, the claimed shadow mask and the cathode ray tube having a plurality of concave and/or convex portions each having a smaller area than the area of the contact surface of a welding electrode are formed on the inner surface of the skirt portion which contacts the welding electrode, at the welding portion between the mask body and the mask frame provides advantages over prior art devices. Specifically, in welding, the contact area between the skirt portion and the welding electrode is reduced so that the pressure per unit area increases and the current density also increases. As a result, the amount of splashes caused from the welding portion is reduced. In addition, the surface part of the skirt portion is subdivided because a large number of concave or convex portions are formed and the sizes of generated splashes are small because the contact area contacting the electrode is small. Further, it is advantageous that splashes which are smaller than the electron beam passage apertures formed in the mask body clogs no apertures even though they scatter to the mask effective section.<sup>1</sup>

In contrast, Iwamoto describes a structure wherein the mask frame and the skirt portion of the shadow mask are each provided with a concave portion and a convex portion (21a, 21b, 22a, 22b), and wherein the concave and convex portions are engaged with each other as shown in Figure 5 of Iwamoto. In Iwamoto, the engagement of the concave and convex portions enables the skirt portion and the mask frame portion to be secured with high

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<sup>1</sup> See Applicants' specification at page 8, lines 5-26.

precision, with a uniform clearance maintained therebetween. Such a configuration prevents the shadow mask from being laterally displaced or angularly offset relative to a support frame and a rectangular phosphor deposited area on the screen plate. Thus, the invention of Iwamoto is not aimed at achieving problems caused by scattering of splashes in a welding portion. Because Iwamoto is not concerned with solving the same problem as the present invention, Iwamoto does not disclose that the at least one of a plurality of concave portions and a plurality of convex portions formed on that region of the inner surface of the skirt portion which a contact surface of an electrode for resistance welding contacts as claimed in Claims 1 and 5. Moreover, Iwamoto does not disclose that each of the plurality of convex/concave portions have a smaller area than an area of a contact surface of the electrode.

Furthermore, Higashinakagawa et al. (USP 4,827,178) is not cited for and does not disclose or suggest the above-described structure present invention. Thus, Claims 1 and 5 patentably define over the present invention. Moreover, as Claims 2-4 and 6-8 depend from Claims 1 and 5 respectively, these claims also patentably define over the present invention.

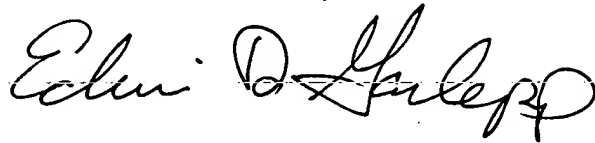
Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in

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condition for formal Allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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